510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE

A. 510(k) Number:
K040362

B. Purpose for Submission:
To seek clearance of a Factor X (FX) Assay

C. Analyte:
Factor X

D. Type of Test:
Quantitative chromogenic assay

E. Applicant:
DiaPharma Group Inc.

F. Proprietary and Established Names:
DiaPharma Factor X Kit

G. Regulatory Information:

1. Regulation section:
   21 CFR 864.7290, Factor Deficiency Test
2. Classification:
   II
3. Product Code:
   GGP
4. Panel:
   81 Hematology

H. Intended Use:

1. Intended use(s):
   The DiaPharma Factor X Kit is an in vitro diagnostic test kit for the quantitative determination of Factor X activity in human citrated plasma.
2. Indication(s) for use:
   Factor X activity is useful for monitoring patients on oral anticoagulant therapy (warfarin) where baseline PT values may be prolonged and INR results are not reliable, such as in OAC patients with lupus inhibitors. The DiaPharma FX kit provides health care providers with a tool for clinical decision making. The DiaPharma Factor X Kit is also useful for screening for factor X deficiencies.
3. Special condition for use statement(s):

4. Special instrument Requirements:

I. Device Description:

Each DiaPharma Factor X Kit consists of enough reagents for ~400 microplate determinations and ~200 automated-method determinations. Each kit contains: chromogenic substrate, Russell Viper Venom, Calcium Chloride, and a tris buffer containing Polybrene® to neutralize heparin.

J. Substantial Equivalence Information:

1. Predicate device name(s):
   Diagnostic Stago Stago Factor X Deficient Plasma
2. Predicate K number(s):
   K933441
3. Comparison with predicate:

Similarities		
Item	**Device**	**Predicate**
Intended Use	For the quantitative determination of Factor X activity in human citrated plasma	same
Test Availability	Professional use	same
Result Interpretation	% Normal	same
Type of Test	Quantitative	same
Differences		
Item	**Device**	**Predicate**
Indications for use	For the detection of possible clotting factor deficiencies in the extrinsic coagulation pathway, and to monitor patients receiving anticoagulant therapy who have developed lupus antibodies	A general screening procedure for the detection of possible clotting factor deficiencies in the extrinsic coagulation pathway
Reagent/Measurement System	Lyophilized reagent (Factor X chromogenic substrate and Russell's Viper Venom) that requires reconstitution; measurement system may be microtiter plate or automated analyzer	Lyophilized reagent (thromboplastin) that requires reconstitution; measurement system by automated analyzer in optical or mechanical modes.
Methodology	Chromogenic	Clotting

K. Standard/Guidance Document Referenced (if applicable):

L. Test Principle:

The method is based on a two-stage principle. Factor X in the sample is activated in the presence of calcium and Russell Viper Venom to activated Factor X (FXa). The generated FXa hydrolyses the chromogenic substrate and liberate the chromogenic group, pNA. The color is read spectrophotometrically, and is proportional to the FX activity in the sample.

A standard curve is requires for each Factor X assay "run". Five standards (calibrators) representing levels of 100%A, 50%, 25%, and 10% (percents of normal) must be included in each run. For standardization, the laboratory may use commercially supplied hemostasis calibration plasma, or may use a pool of calibrated fresh frozen normal plasma.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. Precision/Reproducibility:

Six samples were assayed in one FX kit run in replicates of 10 using a microplate. The samples were two controls (one normal and one prolonged), two patient samples with normal levels, and two patients with prolonged levels.

Precision Data

FX Concentration (%)	CV Within Run
Normal (98 – 107%)	1.9 – 12.0%
Abnormal (23 – 32%)	4.7 – 19.6%

The central tendency for within-run precision of the DiaPharma Factor X kit is approximately 7 %CV.

b. Linearity/assay reportable range:
10-130 % of normal

c. Traceability (controls, calibrators, or method):

d. Detection limit:
10% of normal

e. Analytical specificity:

Plasma blanks are recommended for icteric, lipemic and hemolyzed samples.

The Polybrene® contained in the buffer will neutralize heparin concentrations up to 30 U/ml

f. Assay cut-off:

2. Comparison studies:

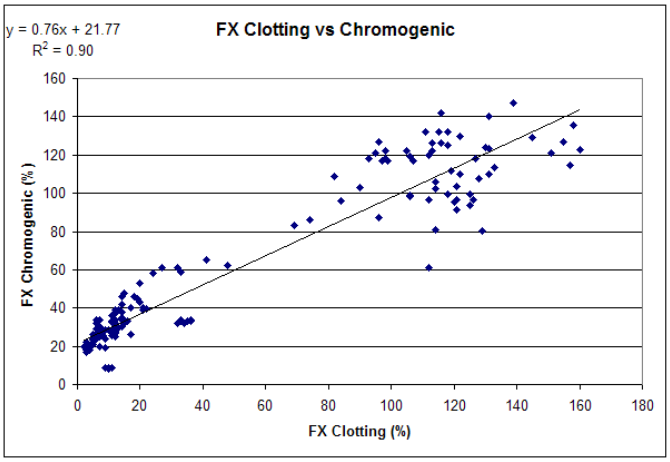
a. Method comparison with predicate device:

A 2 site clinical study (n=155) comparing the DiaPharma Factor X Kit to the predicate device using Diagnostica STA Neoplastine reagent (K922565) on the STA Compact (K961579). 95 samples were analyzed at site 1, 60 samples at site 2. A linear regression was performed, yielding: $y = 0.76 \cdot$ FX Clotting + 21.77, $R2 = 0.90$

Confidence Interval for Slope & Intercept:

FX Clotting (%)		*FX Chromogenic (%)*	
Confidence Level (95.0%)	8.25	Confidence Level (95.0%)	6.65

	Lower 95%	Upper 95%
Intercept	18.77	24.78
X variable	0.72	0.80



b. Matrix comparison:

3. Clinical studies:

a. Clinical sensitivity:

b. Clinical specificity:

c. Other clinical supportive data (when a and b are not applicable):
Clinical studies were done with a total of 241 individuals (92 normals + 149 OAC patients) across three sites. Citrated plasma samples from each individual were assayed by the FX Kit and by the routine prothrombin method at each site. The data were compared by log-log linear regression, and showed a correlation coefficient ("r") of 0.89.

4. Clinical cut-off:

5. Expected values/Reference range:
DiaPharma Factor X has been evaluated in a study with 65 subjects the samples were tested according to standard procedure, and the range of results (90% limits) was 130% to 59%.

N. Conclusion:

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.